

WHAT IS CLAIMED IS:

1 1. An automatic transmission which has at least six
2 selectable forward speeds, the automatic transmission
3 comprising:
4 a reduction planetary gearset which reduces speed of
5 rotation input from an engine;
6 a plurality of planetary gearsets disposed behind the
7 reduction planetary gearset, the plurality of planetary gearsets
8 comprising a ring gear as an input member which inputs
9 reduced rotation from the reduction planetary gearset,
10 individual planetary gearsets respectively comprising a single
11 set of pinion gears;
12 a plurality of clutches which are disposed radially beyond
13 the plurality of planetary gearsets; and
14 a plurality of brakes which are disposed radially beyond
15 the plurality of clutches, the forward speeds of the
16 transmission being selectable through a combination of
17 engagement and disengagement of the plurality of clutches and
18 the plurality of brakes, each brake overlapping with a
19 corresponding clutch in the axial direction.

1 2. The automatic transmission as claimed in claim 1,
2 wherein the plurality of brakes are disposed axially in a row,
3 each brake of which respectively comprising a brake pack.

1 3. The automatic transmission as claimed in claim 2, wherein
2 each brake pack overlaps with a corresponding clutch of the
3 plurality of clutches at least partially in the axial direction.

1 4. The automatic transmission as claimed in claim 2, wherein
2 each clutch comprises a clutch pack, each brake pack
3 overlapping with a corresponding clutch pack at least partially
4 in the axial direction.

1 5. The automatic transmission as claimed in claim 2, wherein
2 a brake pack of one brake greatly overlaps in the axial
3 direction with a corresponding clutch of the plurality of
4 clutches, and a brake pack of another brake overlaps in the
5 axial direction at least partially with a corresponding clutch of
6 the plurality of clutches.

1 6. The automatic transmission as claimed in claim 1, wherein
2 the plurality of brakes comprises two brakes which respectively
3 overlap with a corresponding clutch in the axial direction.

1 7. The automatic transmission as claimed in claim 6, wherein
2 each of the two brakes respectively comprises a brake pack
3 which overlaps with a corresponding clutch of the plurality of
4 clutches in the axial direction.

1 8. The automatic transmission as claimed in claim 7, wherein
2 at least one brake pack of one of the two brakes overlaps
3 greatly with a corresponding clutch.

1 9. The automatic transmission as claimed in claim 1, wherein
2 the plurality of planetary gearsets further comprises an output
3 member which is disposed outside an outer circumference of

4 the plurality of clutches and inside an inner circumference of
5 the plurality of brakes.

1 10. The automatic transmission as claimed in claim 1, wherein
2 the plurality of planetary gearsets further comprises an output
3 drum as an output member which is disposed radially beyond
4 the plurality of clutches and radially within the plurality of
5 brakes.

1 11. The automatic transmission as claimed in claim 10,
2 wherein the plurality of planetary gearsets further comprises a
3 double-sun-gear planetary gearset.

1 12. An automatic transmission which has at least six
2 selectable forward speeds, the automatic transmission
3 comprising:

4 a reduction planetary gearset;

5 a rear planetary gear train disposed behind the reduction
6 planetary gearset, the rear planetary gear train comprising

7 a first rear planetary gearset which is disposed

8 behind the reduction planetary gearset to receive a

9 reduced rotation therefrom, the first rear planetary

10 gearset comprising a sun gear, a single set of pinion

11 gears meshing with the sun gear, and a ring gear

12 meshing with the single set of pinion gears, the ring

13 gear being an input member which inputs the reduced

14 rotation from the reduction planetary gearset, and

15 a second rear planetary gearset which is disposed

16 behind the first rear planetary gearset, the second rear

17 planetary gearset comprising a single set of pinion
18 gears;

19 a plurality of clutches disposed in a row around the rear
20 planetary gear train; and

21 a plurality of brakes disposed in a row around the
22 plurality of clutches, the plurality of brakes comprising a first
23 brake which overlaps in the axial direction with a first clutch of
24 the plurality of clutches, and a second brake which overlaps in
25 the axial direction with a second clutch of the plurality of
26 clutches.

1 13. The automatic transmission as claimed in claim 12,
2 wherein the first brake and the second brake of the plurality of
3 brakes each comprises a set of plates, a set of plates of the
4 first brake overlapping in the axial direction with the first
5 clutch of the plurality of clutches, a set of plates of the second
6 brake overlapping in the axial direction with the second clutch
7 of the plurality of clutches.

1 14. The automatic transmission as claimed in claim 13,
2 wherein a set of plates of the first brake greatly overlap with
3 the first clutch, and a set of plates of the second brake overlap
4 at least partially with the second clutch.

1 15. The automatic transmission as claimed in claim 12,
2 wherein the rear planetary gear train further comprises a drum
3 which is disposed between the plurality of clutches and the
4 plurality of brakes, the drum being joined to an output gear
5 which meshes with a counter gear.

1 16. An automatic transmission comprising:
2 an input member which inputs an engine rotation;
3 a planetary gear train to receive the engine rotation from
4 the input member, the planetary gear train comprising
5 a first planetary gearset acting as a reduction
6 planetary gearset which inputs the engine rotation from the
7 input member,
8 a second planetary gearset disposed behind the first
9 planetary gearset, the second planetary gearset comprising a
10 sun gear, planetary pinions which mesh with the sun gear, a
11 pinion carrier which supports the planetary pinions to be freely
12 rotatable, and a ring gear which meshes with the planetary
13 pinions, the ring gear acting as a planetary-gear-train input
14 member which inputs reduced rotation from the first planetary
15 gearset, and
16 a third planetary gearset disposed behind the second
17 planetary gearset, the third planetary gearset comprising two
18 sun gears, common planetary pinions which mesh with the two
19 sun gears, a pinion carrier which supports the planetary pinions
20 to be freely rotatable, and a ring gear which meshes with the
21 planetary pinions;
22 an output member disposed coaxially with the input
23 member, the output member receiving a rotation from the
24 planetary gear train; and
25 three clutches and two brakes, at least six forward speeds
26 and reverse speed being selectable by selective engagement
27 and disengagement of the three clutches and the two brakes,
28 two clutches of the three clutches being disposed around the

29 planetary gear train, the two brakes being disposed around the
30 two clutches, one clutch of the two clutches and one brake of
31 the two brakes overlapping in the axial direction at least
32 partially, the other clutch of the two clutches and the other
33 brake of the two brakes overlapping in the axial direction at
34 least partially.

1 17. The automatic transmission as claimed in claim 16,
2 wherein the two clutches respectively comprise a set of plates,
3 and the two brakes respectively comprise a set of plates, the
4 set of plates of one brake overlapping in the axial direction at
5 least partially with the set of plates of one clutch, the set of
6 plates of the other brake overlapping in the axial direction at
7 least partially with the set of plates of the other clutch.

1 18. The automatic transmission as claimed in claim 16,
2 wherein the planetary gear train further comprises a planetary-
3 gear-train output member which is disposed outside respective
4 outer circumferences of the two clutches and inside respective
5 inner circumferences of the two brakes.

1 19. The automatic transmission as claimed in claim 16,
2 wherein the planetary gear train further comprises an output
3 drum to transmit rotation of the planetary gear train to the
4 output member, the output drum being disposed between the
5 two clutches and the two brakes.